MEETING 7 MINUTES:

Call to Order UPAMD Power Subgroup meeting – Paul Panepinto 7:12am Pacific 13 January 2011

I. Introductions/Attendance
Bob Davis, Gary Verdun, Ignatius Lee, Lee Atkinson, Edgar Brown, Paul Panepinto

II. Approval of 12/16/2010 Power Subgroup Meeting Notes
Gary Verdun Motion to Approve. Edgar Brown Seconded.

III. Approval of Agenda
Gary Verdun Motion to Approve. Bob Davis Seconded.

IV. IEEE Call for Patents. See
https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf

V. Review Power Topics:

To estimate progress being made, we used this 7th Power Subgroup meeting to review the major topics having been discussed to date.

1. Options for determining whether or not a sink is connected
    a. Check for short to Gnd on one or more comm pins (no digital comm, max power of 20V @ 1A – or whatever is a non-ignition source (terminology TBD)
    b. Check for draw on Pwr-Gnd pins of between 10mA and 25mA (less is no device; more means a short) and if in range, set UPAMD to max power of 20V @ 1A – or non-ignition source (terminology TBD)
    c. UPAMD protocol messages exchanged successfully over comm pins (may not acceptable for determining sink connection/disconnect, because of need for rapidly discharging power to a non-ignition level upon disconnect.)
        a. 1-Wire interface (CAN-bus, Dallas Semi, National Semi, others available)
        b. 2-Wire interface (CAN-bus, RS422)
    d. Other – *No other options were recalled to have been previously proposed*

2. Options for DC voltage on Pwr-Gnd pins prior to connecting to sink device –
(Cannot determine until we get the details of EN 50020 – obsolete; ANSI/UL913 and ANSI/UL60079-11. Requirements internationally and for Europe are found in IEC/EN60079-11.)
    a. 0V (power for comm circuit is on 3rd wire)
    b. 1V (gets pulled up to higher comm level voltage when connected to sink)
    c. 12V
    d. 5V
    e. Other

3. Options for DC voltage while connected to sink device
    a. If no digital communication present, max output 20V @ 1A (non-ignition source level TBD)
    b. If digital communication present, max output 20V @ 8A? – UL 60950 says max output of 240VA with further conditions max voltage of 60V and 8A limit.
        i. Will UPAMD protocol support other negotiated voltages? Possibly. Printers are 32V. At least a single second voltage. Economical. Makes it possible to support a line of higher power workstations or printers.

4. Requirements for returning to non-ignition source level of power if comm is lost or sink device disconnect detected
    a. Within 0.5ms, return to 20V @ 1A (or whatever is deemed to be a non-ignition source level of power)

        Can we have an override? Sink can configure whether or not it wants to fall back to non-ignition source level of power or allow higher power operation even if the **communication fails**. Default when comm. is lost is to go into non-ignition source level of power, but sink can set option to remain in higher power mode even in the event of **communication failure**. It seems like this can be done as long as device connection can still be determined. If communication fails after

having successfully negotiated higher power and the sink can still be determined to be connected, an override is possible.

Device detection needs to be non-messaging or it would have to be 1GHz or higher to meet a 1ms requirement. Differential communication scheme requires some level of impedance. If you can determine you are still connected, but only lost communication, it still might be an option to provide higher current.

There was a debate whether or not you can remain in a higher power mode than the non-ignition source level of power if you successfully negotiated it, but subsequently lost the ability to determine if a device is connected. Lee's concern was an intermittent loss of connection signal when a sink has previously indicated it is not in a hazardous zone may be desirable.

Lee's Proposal: an override can be set indicating that the sink is NOT in a hazardous environment where it needs to guarantee it is a non-ignition source and whenever disconnect is sensed, the amount of time required to discharge the power can take much longer than 0.5ms, 10's of ms perhaps.

b. How do we determine if the sink was disconnected or if comm. signaling failed? Do we need to determine this?
Yes, we need to determine this. If we can know we are connected, we can safely stay in previously initiated mode. No reason to believe the current operating mode is bad. Gary - Concern that inadvertent communications failures will cause systems to fail that shouldn't need to fail. Edgar asked – is there any length of time without communications that might cause the UPAMD to want to shut down? It seems like that as long as you successfully initialize higher power, if you lose communication for any length of time, but can validate that you are connected, you could set an option to still remain in higher power mode.

These are just some notes I made about discussions held on the topics above. Once we've negotiated higher power, there can be very short interruptions where we don't want to shut power down. Can we have a non-safe mode, configured by the sink using communication? When there is a loss of connection sensed, 10ms or longer, allowable? Continued power if we lose **communications**.… Should be no problem. Continued power if we lose **connection**, we must shut down. The sink won't know if it is in a safe area. Whose responsibility to ensure it is in a non-ignition environment? Individuals can't know. Lee's concern was that intermittent connections will cause shutdowns, especially on systems with no battery. Want to avoid much interruption due to intermittent loss of power, due to contact loss.

Edgar – There are several possible causes of the loss of sink device connection: main power interruption, broken cable or connector separation.

VI. Other requirements to discuss:
1. Grounding (example of two pieces of equipment connected across hospital floor with 0.7V difference)
2. How to measure voltage and current
3. Voltage and power requirements for communications channel

VII. Adjourn
Bob motioned to adjourn at 8:22am Pacific.